2-2021

Celiac Disease: Clinical-Pathological Correlation in 100 Consecutive Patients

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Celiac Disease: Clinical-Pathological Correlation

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Introduction & Objectives

- Celiac Disease (CD) has a prevalence of 1-2% across the globe.[1]
  - Intestinal lymphocytosis, villous atrophy, and crypt hyperplasia of intestinal lumen [2]
  - Graded on a scale of 0-3c (Marsh scores)
- Major problem = diagnosis
  - A study done in Italy reported approximately seven out of eight celiac patients go undiagnosed due to minor but significant symptoms.[3]
  - A failure to diagnose CD in patients can result in complications such as severe osteoporosis and intestinal lymphoma.[4]
- Correlation studies between symptoms, serology (tTG-IgA antibodies) and histological severity (Marsh scores) could assist physicians at large university referral centers, such as Thomas Jefferson University Hospital, in diagnosing CD.

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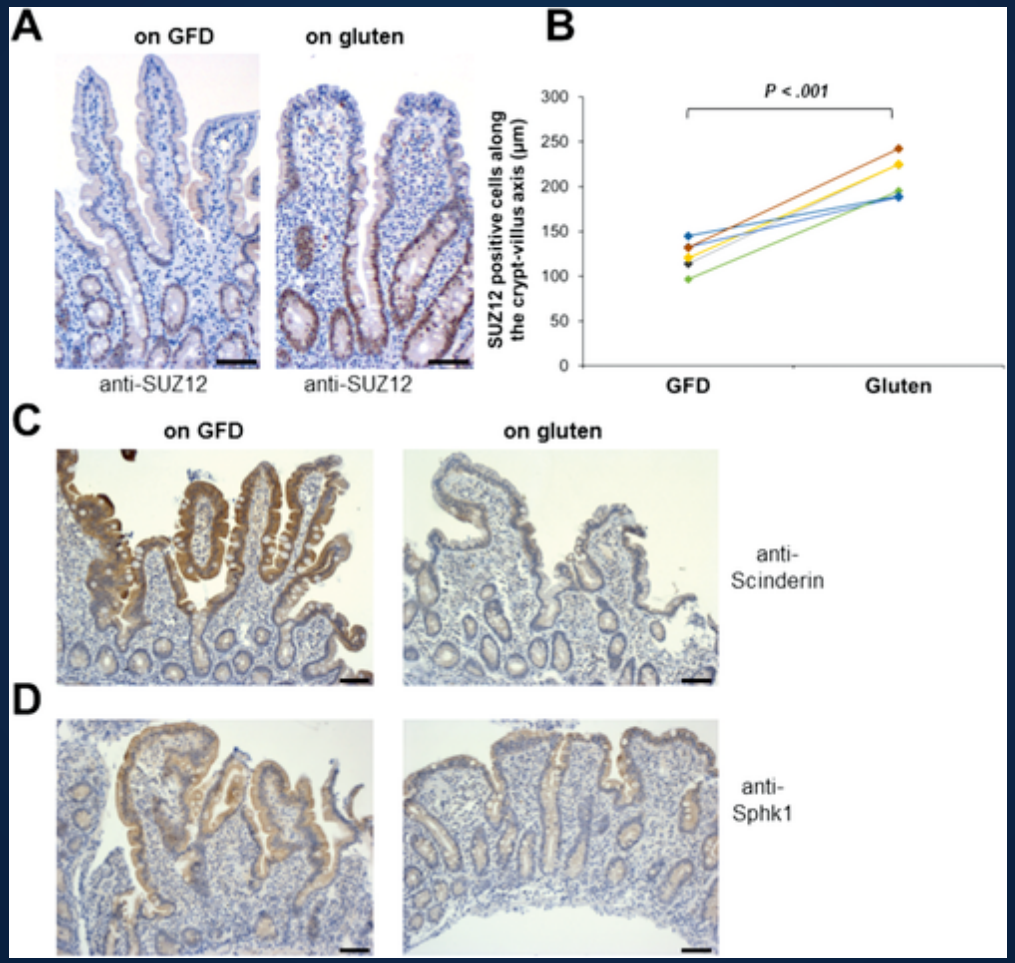
Intestinal Lymphocytosis, Villus Atrophy and Crypt Hyperplasia



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Research Question

- Research Question: Is there a correlation between symptoms/complications, tTG IgA antibodies, presenting age and Marsh scores for patients presenting with Celiac Disease at Thomas Jefferson University Hospital?
  - Purpose: To establish useful relationships for physicians by creating correlation studies between Marsh scores, associated symptoms, BMI, presenting age and tTG IgA antibodies as well as establishing the common presenting symptoms for celiac patients.
  - Variables: Marsh scores, symptoms/complications, tTG-IgA antibodies, BMI, presenting age
  - Population: 140 patients that presented with Celiac disease at Jefferson hospitals as location has been shown to be a factor affecting the genetics behind the disease.[6]

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Specific Aims and Hypothesis

1. Find the most common presenting symptoms of patients with Celiac disease
2. Create a correlation study between Marsh scores (pathologic severity) and tTG-IgA antibodies (serologic severity)
   - Proposed hypothesis: As the pathologic severity increases in celiac patients, so will the serologic severity resulting in a significant positive correlation.
3. Identify the relationship between Marsh scores and presenting age.
   - Proposed hypothesis: As presenting age increases so will the pathologic severity of the disease.
4. Determine the average body mass index (BMI).
   - Proposed hypothesis: The average BMI for patients presenting with Celiac will be low-normal due to patients' malabsorption.
5. Identify the gender breakdown of patients presenting with celiac disease.
   - Proposed hypothesis: Like other autoimmune diseases, more women will present with celiac disease compared to men.

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Methods

- Study design: Retrospective chart review at an urban, tertiary hospital (Thomas Jefferson University Hospital)
- Population / study sample: patients diagnosed with Celiac Disease at Thomas Jefferson University Hospital (TJUH) with both a Marsh score and a tTG-IgA antibody result.
- Intervention: none (retrospective study)
- Comparison group: not applicable
- Outcome (dependent variables): Age at diagnosis, BMI, presenting symptoms/complications, appropriate clinical values (Marsh score and tTG-IgA antibody result), adherence to diet
- Data source and collection: Access to EPIC was granted through an OHR-12B submission.
- Analysis via correlation statistics using Marsh scores and tTG-IgA antibody values

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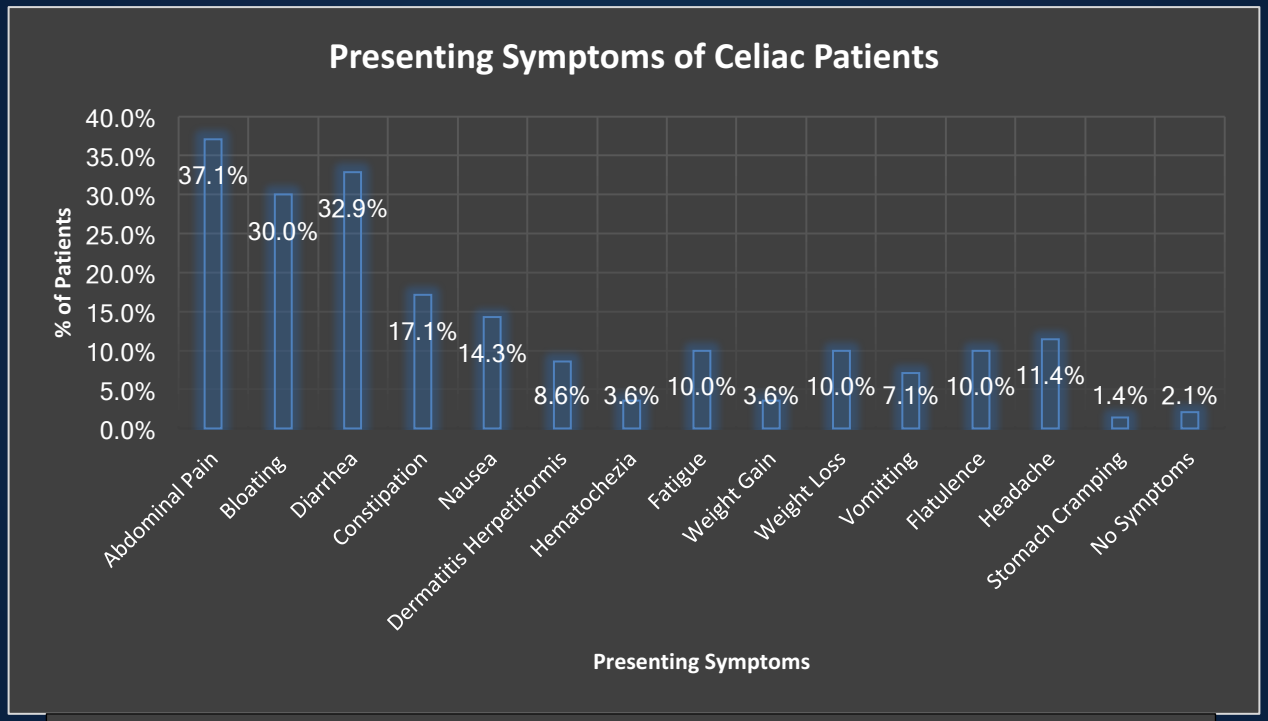

Some patients have more than one symptom thus making the total >100%. Patients reported with no symptoms were evaluated because of family history. The three major presenting symptoms were abdominal pain, bloating, and diarrhea. These symptoms were gathered in a record review of chief presenting symptoms to a gastroenterology practice.

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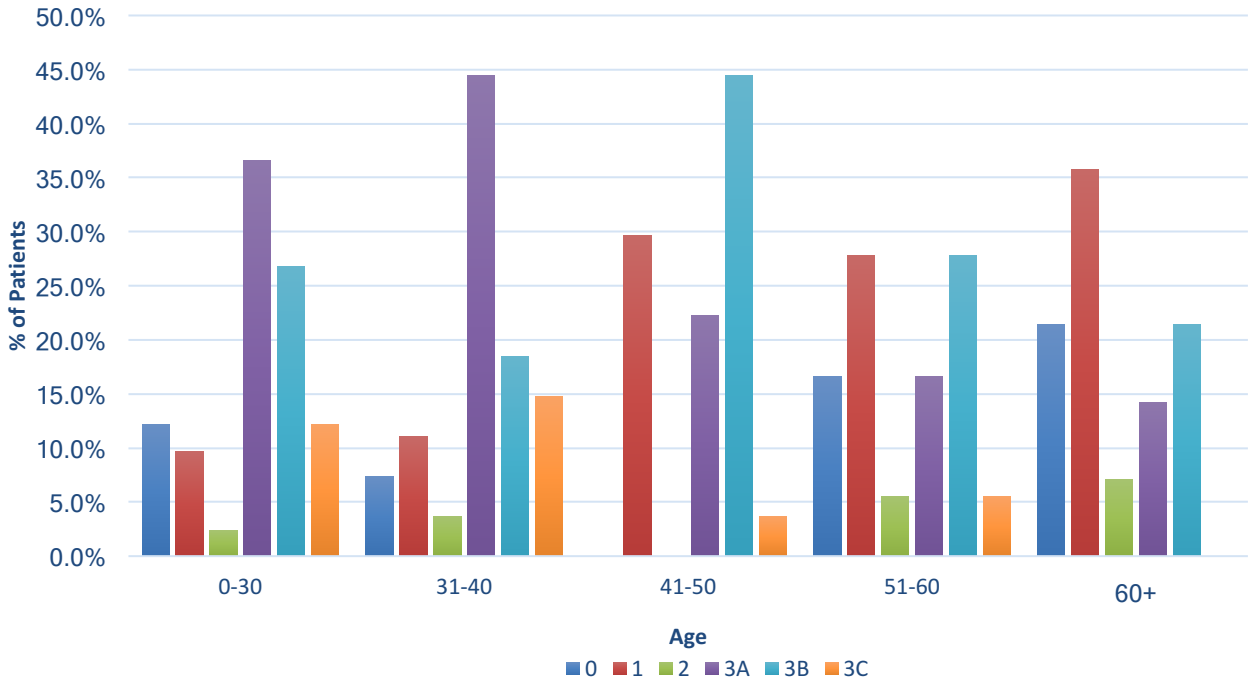
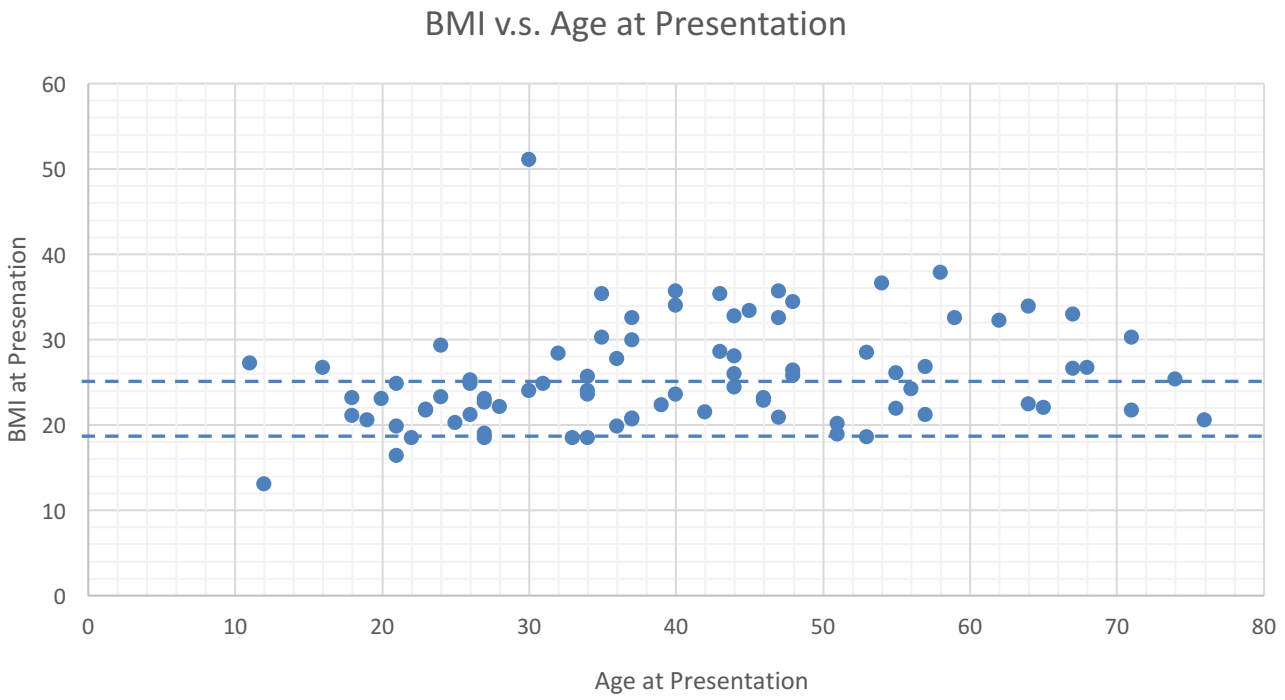
Correlation Description	Correlation Coefficient
Marsh v.s. TTG IgA	-0.23
Marsh v.s. Gliadin IgA	-0.39
Marsh v.s. BMI	-0.01
TTG IgA v.s. Gliadin IgA	0.56
BMI v.s. TTG IgA	-0.10
BMI v.s. Gliadin IgA	-0.11
Age@P v.s. Marsh Score	-0.03
Age@P v.s. TTG IgA	0.06
Age@P v.s. Gliadin IgA	-0.17
Age@P v.s. BMI	0.26

Presenting Marsh Scores of Celiac Patients (Age)



Diagnostic criteria for celiac disease was defined as a positive biopsy (>0) and/or positive serology (elevated TTG IgA/IgG antibodies). Patients who presented with a Marsh score of zero had positive serology. There was a wide variation in Marsh scores with no particular pattern identified when evaluated by age.



As per CDC guidelines, a healthy BMI is between 18.5 and 24.9 kg/m^2 as outlined by the dashed lines. Out of the 84 patients that had their BMI calculated, 40 patients (48%) had a BMI at presentation that was between these values, 5 patients (6%) were below, and 39 patients (46%) were above the recommended BMI of 24.9 kg/m^2. Of the 39 patients with a BMI over 24.9 kg/m^2, 19 patients (23%) were considered obese at a BMI over 30 kg/m^2.

	Average	Standard Deviation
Age	40.11	16.11
BMI	25.64	6.09

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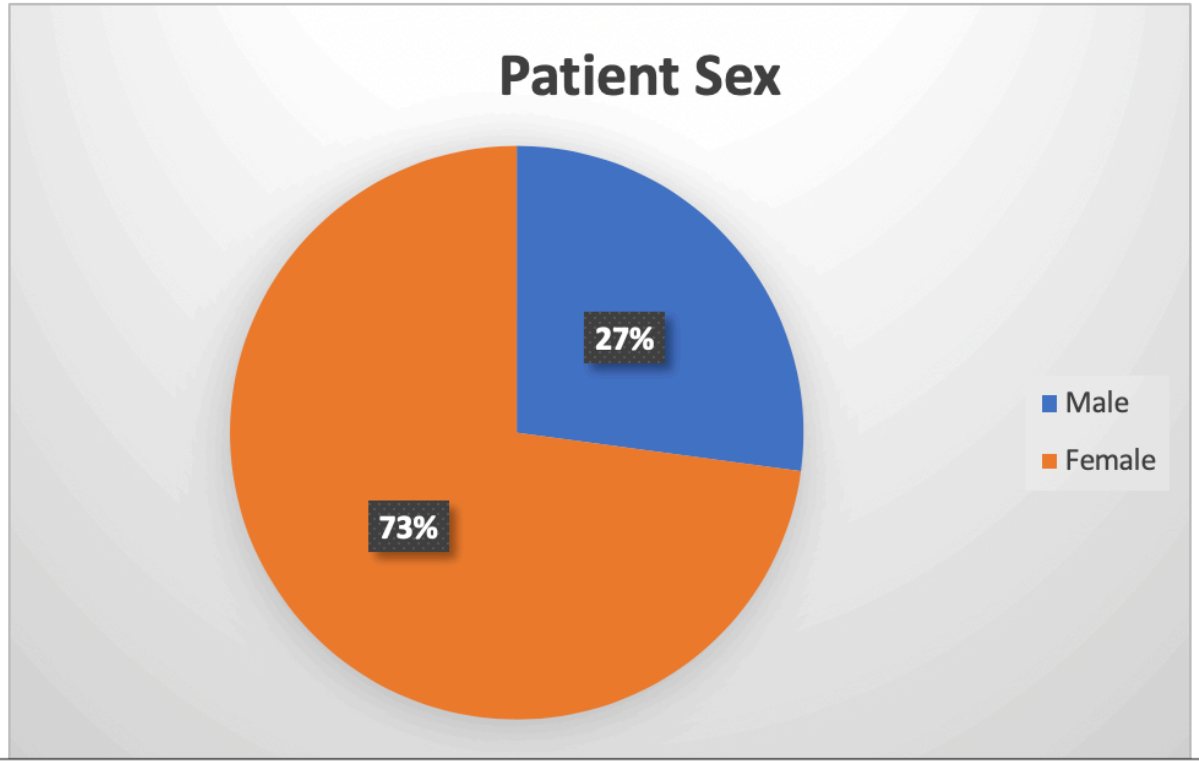

Out of the 140 patients in this study, 102 patients (73%) were female and 38 patients (27%) were male.

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Conclusions

1. There were a wide variety of presenting symptoms for celiac patients. The three major presenting symptoms were abdominal pain, bloating, and diarrhea.
2. We did not find a correlation between Marsh scores and tTG-IgA antibodies.
3. We did not find a correlation between presenting age and Marsh score.
4. 46% of patients presented with a BMI of over 24.9 kg/m^2.
5. 73% of presented celiac patients identified as female.

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Future Direction

- The wide variety of presenting symptoms for Celiac Disease along with the lack of positive correlation between serology and pathology warrant further evaluation for the efficacy of implementing a Celiac screening protocol.

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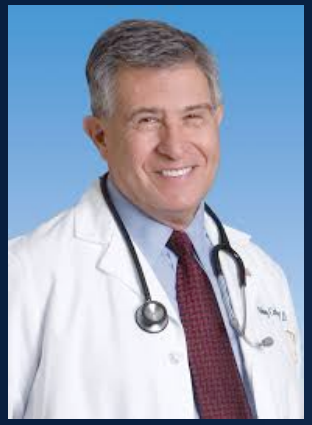
Acknowledgements



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